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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/791,868	SUGIMOTO, TASUKU
	Examiner	Art Unit
	Edward Park	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

3. **Claim 20** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 20 defines a storage medium embodying functional descriptive material. However, the claim does not define a computer-readable medium or computer-readable memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium" which are deemed non-statutory (refer to "note" below). Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

"A transitory, propagating signal … is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (*In re Petrus A.C.M. Nuijten;* Fed Cir, 2006-1371, 9/20/2007).

Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a "signal", the claim as a whole would be non-statutory. In the case where the specification defines the computer readable medium or memory as statutory

tangible products such as a hard drive, ROM, RAM, etc, as well as a non-statutory entity such as a “signal”, “carrier wave”, or “transmission medium”, the examiner suggests amending the claim to *include* the disclosed tangible computer readable media, while at the same time *excluding* the intangible media such as signals, carrier waves, etc.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 1, 5-9, 11, 12, 13, 14, 18, 19, 20** are rejected under 35 U.S.C. 102(b) as being anticipated by Norimatsu (US 6,415,053 B1).

Regarding **claim 1**, Norimatsu discloses an image processing device for processing an original image including multiple pixels to create a new image, each of the multiple pixels having a pixel value, the device comprising:

an extracting unit extracting, from multiple pixel values of multiple pixels, an original pixel value of a pixel and pixel values of surrounding pixels that are positioned to surround the subject pixel, the subject pixel and the surrounding pixels being arranged in a matrix configuration (see

fig. 10a1-8; col. 3, lines 63-67; col. 4, lines 1-12, pixel of interest and its surrounding pixels from pixel values of the pixel of interest and its surrounding pixels of image composed of the color image signals that are to be subjected to image processing);

a first calculating unit calculating a differential vector for the subject pixel by performing a differential operation on the pixel values of the surrounding pixels and calculating a vector magnitude of the differential vector and a vector direction of the differential vector (see col. 3, lines 63-67; col. 4, lines 1-12, calculating gradients representing directions and intensities of a pixel of interest and its surrounding pixels from pixel values of the pixel of interest and its surrounding pixels of image composed of the color image signals);

a second calculating unit calculating a new pixel value of the subject pixel based on the original pixel value of the subject pixel, a value determined dependently on the vector magnitude, and a pixel value of an adjustment pixel, the adjustment pixel being one of at least one first candidate surrounding pixel and at least one second candidate surrounding pixel, the at least one first candidate surrounding pixel being positioned in the vector direction, the at least one second candidate surrounding pixel being positioned in an opposite vector direction to the vector direction, the adjustment pixel having a pixel value closest to the original pixel value of the subject pixel among the at least one first candidate surrounding pixel and the at least one second candidate surrounding pixel (see col. 4, lines 5-35, calculating connectivity of the pixel of interest with its surround pixels from the directions of the stored gradients by calculating directivities of respective R, G and B of the pixel of interest; where connectivity of the pixel of interest with its surround pixel is calculated, if the directions of gradient of the adjacent pixels that are located on opposite sides of the pixel of interest in a direction of 90 degrees from the

direction of gradient of the pixel of interest are within 45 degrees, it is decided that the connectivity exists); and

a setting unit setting the new pixel value to the subject pixel, thereby obtaining a new image (see col. 4, lines 27-40, calculating at least one correction amount of degree of sharpness enhancement and a granularity to produce output image data).

Regarding **claim 5**, Norimatsu discloses performing the differential operation by using a Sobel filter (see col. 17, lines 35-51, Sobel operator).

Regarding **claim 6**, Norimatsu discloses performing the differential operation by using a Prewitt filter (see col. 17, lines 35-51 Prewitt operator).

Regarding **claim 7**, Norimatsu discloses subject pixel and the surrounding pixels are arranged in an n x n matrix configuration, where n is an odd number that is equal to or greater than three (see fig. 10a1-8; col. 17, lines 35-51, matrix that is 3x3 or 5x5).

Regarding **claim 8**, Norimatsu discloses subject pixel is a central pixel that is positioned at a center of the n x n matrix (see col. 17, lines 35-67).

Regarding **claim 9**, Norimatsu discloses n x n matrix is a 3 x 3 matrix (see fig. 10a1-8; col. 17, lines 35-51, matrix that is 3x3).

Regarding **claim 11**, Norimatsu discloses n x n matrix is a 5 x 5 matrix (see col. 17, lines 35-51, matrix that is 5x5).

Regarding **claim 12**, Norimatsu discloses an image forming unit forming the new image on a medium (see fig. 15, numeral 116M, 118; col. 26, lines 21-47, output the processed image data outside the apparatus as an image file such as a CD or laser printer unit 118).

Regarding **claim 13**, Norimatsu discloses an image processing device for processing an original image including multiple pixels to create a new image, each of the multiple pixels having a pixel value, the device comprising:

an extracting unit extracting, from multiple pixel values of multiple pixels, an original pixel value of a subject pixel and pixel values of surrounding pixels that are positioned to surround the subject pixel, the subject pixel. and the surrounding pixels being arranged in a 3x3 matrix configuration (see fig. 10a1-8; col. 3, lines 63-67; col. 4, lines 1-12, pixel of interest and its surrounding pixels from pixel values of the pixel of interest and its surrounding pixels of image composed of the color image signals that are to be subjected to image processing);

a first calculating unit calculating a differential vector for the subject pixel by performing a differential on the pixel values of the surrounding pixels and calculating a vector magnitude of the differential vector and a vector direction of the differential vector (see col. 3, lines 63-67; col. 4, lines 1-12, calculating gradients representing directions and intensities of a pixel of interest and its surrounding pixels from pixel values of the pixel of interest and its surrounding pixels of image composed of the color image signals);

a second calculating unit calculating a new pixel value of the subject pixel based on the original pixel value the subject pixel, a value determined dependently on the vector magnitude, and a pixel value of an adjustment pixel, the adjustment pixel being one of a first candidate surrounding pixel positioned in the vector direction and a second candidate surrounding pixel positioned in an opposite vector direction opposite to the vector direction, the adjustment pixel having a pixel value closer to the original pixel value of the subject pixel than the other candidate

surrounding pixel (see col. 4, lines 5-35, calculating connectivity of the pixel of interest with its surround pixels from the directions of the stored gradients by calculating directivities of respective R, G and B of the pixel of interest; where connectivity of the pixel of interest with its surround pixel is calculated, if the directions of gradient of the adjacent pixels that are located on opposite sides of the pixel of interest in a direction of 90 degrees from the direction of gradient of the pixel of interest are within 45 degrees, it is decided that the connectivity exists); and

a setting unit setting the new pixel value to the subject pixel, thereby obtaining a new image (see col. 4, lines 27-40, calculating at least one correction amount of degree of sharpness enhancement and a granularity to produce output image data).

Regarding **claim 14**, Norimatsu discloses an image processing method of processing an original image including multiple pixels to create a new image, each of the multiple pixels having a pixel value, the method comprising:

extracting, from multiple pixel values of multiple pixels, an original pixel value of a subject pixel and pixel values of surrounding pixels that are positioned to surround the subject pixel, the subject pixel and the surrounding pixels being arranged in a matrix configuration (see fig. 10a1-8; col. 3, lines 63-67; col. 4, lines 1-12, pixel of interest and its surrounding pixels from pixel values of the pixel of interest and its surrounding pixels of image composed of the color image signals that are to be subjected to image processing);

calculating a differential vector for the subject pixel by performing a differential operation on the pixel values of the surrounding pixels and calculating a vector magnitude of the differential vector and a vector direction of the differential vector (see col. 3, lines 63-67; col. 4, lines 1-12, calculating gradients representing directions and intensities of a pixel of interest and its

surrounding pixels from pixel values of the pixel of interest and its surrounding pixels of image composed of the color image signals);

calculating a new pixel value of the subject pixel based on the original pixel value of the subject pixel, a value determined dependently on the vector magnitude, and a pixel value of an adjustment pixel, the adjustment pixel being one of at least one first candidate surrounding pixel and at least one second candidate surrounding pixel, the at least one first candidate surrounding pixel being positioned in the vector direction, the at least one second candidate surrounding pixel being positioned in an opposite vector direction opposite to the vector direction, the adjustment pixel having a pixel value closest to the original pixel value of the subject pixel among the at least one first candidate surrounding pixel and the at least one second candidate surrounding pixel (see col. 4, lines 5-35, calculating connectivity of the pixel of interest with its surround pixels from the directions of the stored gradients by calculating directivities of respective R, G and B of the pixel of interest; where connectivity of the pixel of interest with its surround pixel is calculated, if the directions of gradient of the adjacent pixels that are located on opposite sides of the pixel of interest in a direction of 90 degrees from the direction of gradient of the pixel of interest are within 45 degrees, it is decided that the connectivity exists); and

setting the new pixel value to the subject pixel, thereby obtaining a new image (see col. 4, lines 27-40, calculating at least one correction amount of degree of sharpness enhancement and a granularity to produce output image data).

Regarding **claim 18**, Norimatsu discloses performing the differential operation by using a Sobel filter (see col. 17, lines 35-51, Sobel operator).

Regarding **claim 19**, Norimatsu discloses performing the differential operation by using a Prewitt filter (see col. 17, lines 35-51 Prewitt operator).

Regarding **claim 20**, Norimatsu discloses a storage medium for storing a program (see col. 26, lines 21-33; image memory holds various image processing operations including corrections) of processing an original image including multiple pixels to create a new image, each of the multiple pixels having a pixel value, the program comprising the programs of: extracting, from multiple pixel values of multiple pixels, an original pixel value of a subject pixel and pixel values of surrounding pixels that are positioned to surround the subject pixel, the subject pixel and the surrounding pixels being arranged in a matrix configuration (see fig. 10a1-8; col. 3, lines 63-67; col. 4, lines 1-12, pixel of interest and its surrounding pixels from pixel values of the pixel of interest and its surrounding pixels of image composed of the color image signals that are to be subjected to image processing);

calculating a differential vector for the subject by performing a differential operation on the pixel values of the surrounding pixels and calculating a vector magnitude of the differential vector and a vector direction of the differential vector (see col. 3, lines 63-67; col. 4, lines 1-12, calculating gradients representing directions and intensities of a pixel of interest and its surrounding pixels from pixel values of the pixel of interest and its surrounding pixels of image composed of the color image signals);

calculating a new pixel value of the subject pixel based on the original pixel value of the subject pixel, a value determined dependently on the vector magnitude, and a pixel value of an adjustment pixel, the adjustment pixel being one of a t least one first candidate surrounding pixel

and at least one second candidate surrounding pixel, the at is least one first candidate surrounding pixel being positioned in the vector direction, the at least one second candidate surrounding pixel being positioned in an opposite vector direction opposite to the vector direction, the adjustment pixel having a pixel value closest to the original pixel value of the subject pixel among the at least one first candidate surrounding pixel and the at least one second candidate surrounding pixel (see col. 4, lines 5-35, calculating connectivity of the pixel of interest with its surround pixels from the directions of the stored gradients by calculating directivities of respective R, G and B of the pixel of interest; where connectivity of the pixel of interest with its surround pixel is calculated, if the directions of gradient of the adjacent pixels that are located on opposite sides of the pixel of interest in a direction of 90 degrees from the direction of gradient of the pixel of interest are within 45 degrees, it is decided that the connectivity exists); and

setting the new pixel value to the subject pixel, thereby obtaining a new image (see col. 4, lines 27-40, calculating at least one correction amount of degree of sharpness enhancement and a granularity to produce output image data).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

> skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 2, 3, 4, 15, 16, 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Norimatsu (US 6,415,053 B1) and in view of Miller et al (US 4,941,191)

Regarding **claims 2, 3, 4,** Norimatsu reference discloses all elements as mentioned above in claim 1. Norimatsu reference further discloses multiple pixels are arranged in an x-direction and a y-direction, wherein the subject pixel is located at a two dimensional location (i, j) that is x-direction and y-direction coordinates of the subject pixel (see figures 10a1-a8). Norimatsu does not disclose a second calculating unit calculates the new pixel value of the subject pixel based on an equation: g (i , j) = f(I, j) + KT x (G - f (i , j)) where g (i , j) is the new pixel value of the subject pixel, f(l, j) i s the original pixel value of the subject pixel, KT is the value determined dependently on the vector magnitude, and G is the pixel value of the adjustment pixel; and wherein the value KT has a value satisfying an inequality 0 <= KT <= 1; and a comparing unit comparing the vector magnitude with at least one of a first threshold value and a second threshold value that is greater than the first threshold value; and a KT setting unit setting the value KT to a value of zero (0) , when the vector magnitude is less than or equal to the first threshold value, thereby allowing the new pixel value g (i , j) to take a value that is the same as the lo original pixel value f (i, j) , the KT setting unit: setting the value KT to a value between zero (0) and one (1), when the vector magnitude is greater than the first threshold value and is leas than or equal to the second threshold value, thereby allowing the new pixel value g (i , j) to take a value between the original pixel value f(i, j) and the pixel value of the adjustment pixel G, and the KT setting unit setting the value KT to a value of one (1), when the vector magnitude is

Miller, in the same field of endeavor, teaches a second calculating unit calculates the new pixel value of the subject pixel based on an equation: $g(i, j) = f(i, j) + KT \times (G - f(i, j))$ where $g(i, j)$ is the new pixel value of the subject pixel, $f(i, j)$ i s the original pixel value of the subject pixel, KT is the value determined dependently on the vector magnitude, and G is the pixel value of the adjustment pixel; and wherein the value KT has a value satisfying an inequality $0 <= KT <= 1$ (see col. 9, lines 18-68); and comparing the vector magnitude with. at least one of a first threshold value and a second threshold value that is greater than the first threshold value; and setting the value KT to a value of zero (0) , when the vector magnitude is less than or equal to the first threshold value, thereby allowing the new pixel value $g(i, j)$ to take a value that is the same as the original pixel value $f(i, j)$, setting the value KT to a value between zero (0) and one (1), when the vector magnitude is greater than the first threshold value and is less than or equal to the second threshold value, thereby allowing the new pixel value $g(i, j)$,to take a value between the original pixel value $f(i, j)$ and the pixel value of the adjustment pixel G, and setting the value KT to a value of one (1), when the vector magnitude is greater than the second threshold value, thereby allowing the new pixel value $g(i, j)$ to take a value that is the same as the pixel value of the adjustment pixel (see col. 12, lines 26-55).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the reference Norimatsu reference to utilize the equations to a form new pixel value and vary the values of the threshold as taught by Miller, to process the pixel values through a high-pass filter for processing of extracted information for the enhanced detection of anomalies within the image (see col. 8, lines 45-56).

8. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Norimatsu (US 6,415,053 B1) and in view of Mancuso et al (US 2001/0031097 A1).

Regarding **claim 10**, Norimatsu reference discloses all elements as mentioned above in claim 9. Norimatsu reference further discloses multiple pixels are arranged in an x-direction and y-direction, i and j being respectively x-direction and y-direction coordinates of the subject pixel, wherein the differential vector has an x-directional component H (i , j) and a y-directional component V (i , j) expressed by equations:

H (i , j) = -1 x f(i-1, j-1) -2 x f(i-1, j) -1 x f(i-I, j + 1) + f(i+l, j-1) +2 f (i + 1 , j) + f (i+l, j+l), and

V (i , j) - -1 x f (i-1, 1-11 + f (i-1, j+l) -2 x f(i, j-1) +2 x f(i, j+l) -1 x f (i+l, j-1) + f(i+l, j+l),

where f (i-1, 1-1) , f (i-1, j), f (i-1, j+l) , f(i, j-1), f (i, 1) f (i+l, - 1 , f (i+l, j), and f (i+l, 1) are respectively the pixel values of the surrounding pixels that are located at two-dimensional locations (i-1, j-1) , (i-1, j), (i-1, j+l), (i, j-1), (i, j+l), (i+l, j-1), (i+l, j), and (i+l, j+l) (see figures 10a1 and 10a7, col. 22, lines 47-67; col. 23, lines 1-9). Norimatsu does not disclose a vector magnitude of the differential vector is expressed by an equation (as shown in claim 10) and a vector direction of the differential vector is expressed by an equation (as shown in claim 10).

Mancuso, in the same field of endeavor, teaches a vector magnitude of the differential vector is expressed by an equation (as shown in claim 10) (see paragraph [0026], magnitude of the vector) and a vector direction of the differential vector is expressed by an equation (as shown in claim 10) (see paragraph [0028], direction angle of the vector).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the reference Norimatsu reference to utilize the equations to calculate the vector magnitude and vector direction as taught by Mancuso, to pre-process for extracting image pixels

greater than the second threshold value, thereby allowing the new pixel value g(i, j) to take a value that is the same as the pixel value of the adjustment pixel.

Miller, in the same field of endeavor, teaches a second calculating unit calculates the new pixel value of the subject pixel based on an equation: g (i , j) = f(i, j) + KT x (G - f (i , j)) where g (i , j) is the new pixel value of the subject pixel, f(i, j) i s the original pixel value of the subject pixel, KT is the value determined dependently on the vector magnitude, and G is the pixel value of the adjustment pixel; and wherein the value KT has a value satisfying an inequality 0 <= KT <= 1 (see col. 9, lines 18-68); and a comparing unit comparing the vector magnitude with at least one of a first threshold value and a second threshold value that is greater than the first threshold value; and a KT setting unit setting the value KT to a value of zero (0) , when the vector magnitude is less than or equal to the first threshold value, thereby allowing the new pixel value g (i , j) to take a value that is the same as the original pixel value f (i, j) , the KT setting unit: setting the value KT to a value between zero (0) and one (1), when the vector magnitude is greater than the first threshold value and is leas than or equal to the second threshold value, thereby allowing the new pixel value g (i , j) to take a value between the original pixel value f(i, j) and the pixel value of the adjustment pixel G, and the KT setting unit setting the value KT to a value of one (1), when the vector magnitude is greater than the second threshold value, thereby allowing the new pixel value g(i, j) to take a value that is the same as the pixel value of the adjustment pixel (see col. 12, lines 26-55).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the reference Norimatsu reference to utilize the equations to a form new pixel value and vary the values of the threshold as taught by Miller, to process the pixel values through

a high-pass filter for processing of extracted information for the enhanced detection of anomalies within the image (see col. 8, lines 45-56).

Regarding **claims 15, 16, 17,** Norimatsu reference discloses all elements as mentioned above in claim 14. Norimatsu reference further discloses multiple pixels are arranged in an x-direction and a y-direction, wherein the subject pixel is located at a two dimensional location (i, j) that is x-direction and y-direction coordinates of the subject pixel (see figures 10a1-a8). Norimatsu does not disclose a second calculating unit calculates the new pixel value of the subject pixel based on an equation: g (i , j) = f(i, j) + KT x (G - f (i , j)) where g (i , j) is the new pixel value of the subject pixel, f(l, j) i s the original pixel value of the subject pixel, KT is the value determined dependently on the vector magnitude, and G is the pixel value of the adjustment pixel; and wherein the value KT has a value satisfying an inequality 0 <= KT <= 1; and comparing the vector magnitude with. at least one of a first threshold value and a second threshold value that is greater than the first threshold value; and setting the value KT to a value of zero (0) , when the vector magnitude is less than or equal to the first threshold value, thereby allowing the new pixel value g (i, j) to take a value that is the same as the original pixel value f (i, j), setting the value KT to a value between zero (0) and one (1), when the vector magnitude is greater than the first threshold value and is less than or equal to the second threshold value, thereby allowing the new pixel value g(i, j) ,to take a value between the original pixel value f(i, j) and the pixel value of the adjustment pixel G, and setting the value KT to a value of one (1), when the vector magnitude is greater than the second threshold value, thereby allowing the new pixel value g(i, j) to take a value that is the same as the pixel value of the adjustment pixel.

which can provide both differencing and smoothing which compensates for noise (see paragraph [0024]). Examiner notes that these formulas are well known both in image analysis and in analytical mathematics in regards to vector calculations.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward Park whose telephone number is (571) 270-1576. The examiner can normally be reached on M-F 10:30 - 20:00, (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Edward Park
Examiner
Art Unit 2624

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VIKKRAM BALI
PRIMARY EXAMINER